

Informational Leaflet 69

STATUS OF THE COOK INLET-RESURRECTION BAY COMMERCIAL SALMON FISHERY, 1965

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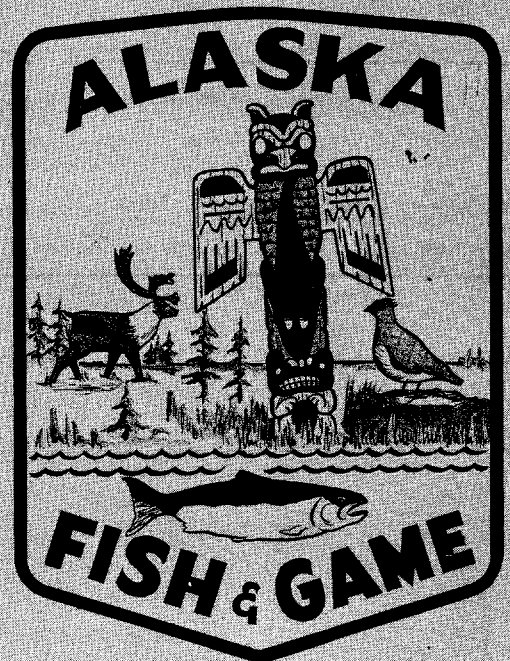


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HIGHLIGHTS

During the first six years of state management of the Cook Inlet-Resurrection Bay Area:

.....over five and a quarter million more salmon were caught than during the previous six years.

.....fishermen received over \$5 million more for their salmon than during the previous six years.

.....pink salmon catches increased 39 per cent, coho salmon catches increased 30 per cent, red salmon catches increased 24 per cent, and chum salmon catches increased 12 per cent, as compared with the previous six years.

.....as compared with the six years prior to state management, catches in the Northern District increased by 10 per cent, in the North Central and South Central Districts by 29 per cent, in the Kamishak Bay District by 224 per cent, in the Outer District by 69 per cent. Catches decreased by 10 per cent in the Southern District and 88 per cent in the Eastern District.

ABSTRACT

Alaska has managed its salmon resources for six seasons. This report compares catches in the Cook Inlet-Resurrection Bay Area for the six years since the state obtained control of fish and game (1960-65) with the previous six years (1954-59)

Salmon caught in the seven districts from 1954 to 1959 totalled 19,639,306: between 1960 and 1965, 24,986,605, for an increase of 27 per cent. Harvest increased for all species except for king salmon. Greatest increase occurred with pinks, for a 39 per cent rise. The coho catch increased 30 per cent, the red catch increased 24 per cent, and the chum catch increased by 12 per cent.

In the past six years 150 set netters in the Northern District have taken 10 per cent more fish than during the previous six years. This district accounted for 11 per cent of all salmon taken within the entire management area during the past six years. Pink salmon accounted for 42 per cent of the catch in this district during the past six years.

In the North Central and South Central Districts (combined for this report) 703 resident and 138 non-resident fishermen fish. Since 1960 69 per cent of the salmon taken in the Cook Inlet-Resurrection Bay Management Area have been caught in these two districts, and 29 per cent more fish were caught in these districts between 1960 and 1965 than during 1954-59. Greatest increase was in pink salmon, with 39 per cent more individuals taken. Pinks comprised 37 per cent of the catch, reds 36 per cent, and chums 20 per cent. Sixty per cent of the total catch may be made in these districts during two or three 24-hour fishing periods at the peak of the run. The Kenai River, in the North Central District, is probably the most important red salmon producer in the Cook Inlet Management Area.

The Southern District is fished by 12 set net fishermen and from 10 to 50 seiners. Since 1960 7 per cent of the Cook Inlet-Resurrection Bay Area catch has been made here. A decrease of 10 per cent occurred in the catch from 1954-59 to 1960-65. Pink salmon make up 91 per cent of the catch in this district, and the fish caught here are bound for local streams. Red salmon, taken mostly by set netters, are bound generally for streams in more northerly areas of the Inlet.

The Kamishak Bay District, fished exclusively by seines, contributed 1 per cent of the total salmon catch for the management area. 49 per cent of the fish were pinks and 49 per cent were chums. Because of harsh weather, rocks and reefs, and its remoteness, this is the most difficult district in the area to fish for salmon.

The Outer District, fished by seines only, has produced an average of 11 per cent of salmon in the management area since 1960. 69 per cent more fish were caught from 1960 to 1965 than from 1954-59. Pinks comprise 81 per cent of the catch and chums 18 per cent, from this district. The March 1964 earthquake adversely affected pink catches in the Outer District in 1965; the chum catch for 1967 is expected to be weak from the same cause. Port Dick is the most productive single area in the District.

The Eastern District is the least important commercial salmon producing district of the management area, and since 1960 has produced an average of but .3 per cent of the salmon harvest.

King salmon reached a peak catch of 187,000 in 1951 and then the catch declined until 1961 when fishing time was curtailed. Since 1964 salmon season has been set so that approximately 90 per cent of Cook Inlet's king salmon have reached spawning grounds before the season opens.

Cook Inlet's red salmon catch is the second largest in Alaska, and the general trend for this catch has been upward since 1960. Major red salmon drainages are the Kenai and Kasilof Rivers. Numerous small drainages that produce red salmon probably contribute appreciably to the catch.

Coho salmon in Cook Inlet are characterized by an even-year odd-year fluctuation, the strong runs occurring during even years. Since 1960 39 per cent of the Inlet's cohos have been taken in the Northern District.

Pink salmon, which are now abundant during even numbered years, were relatively unimportant in the Cook Inlet salmon pack of the late 1930's. Since 1952 pinks have increased steadily. The 1964 pack was 188,800 cases. The tremendous numbers of pinks that arrive in the gill net areas of Cook Inlet tend to mask catch figures for other species. The largest numbers of pinks are caught in the North Central and South Central Districts.

Pinks, arriving in abundance simultaneously with strong runs of reds, chums, and cohos, may overwhelm present Cook Inlet processing facilities.

Chum salmon packs for Cook Inlet have increased markedly in recent years, and the 1964 chum pack of nearly 136,000 cases was the largest ever packed in the Inlet. No explanation is available for the decrease in chums in 1965. Chum runs were almost uniformly weak all along the Pacific coast in 1965.

Cook Inlet has too many salmon fishermen. Fishing time must be held to two 24-hour fishing periods a week during much of the season in order to insure escapement. So much fishing gear is present that it is conceivable that under unusual circumstances the fishery could be damaged during a 24-hour fishing period.

Canneries must handle large quantities of salmon twice a week, and then may lay idle on other days. During weak runs canneries may be unable to buy sufficient fish for profitable operations.

The individual average annual gross income, all Cook Inlet salmon gear license holders, from 1959-64 was \$3,313.

In 1962 non-residents caught 13 per cent of Alaska's salmon; in 1963 28 per cent, and in 1964 20 per cent.

Prior to 1947 there was no important drift fishery. Drift gear peaked in 1951 with approximately 560 boats. Percentage of catch by various types of gear fluctuates. Since elimination of traps in 1959, the average percentage of salmon taken by set nets has risen by 16, while the average percentage of drift gear catch has risen by 4.

Since 1958 set nets have taken an average of 45 per cent of the Inlet's salmon, drift gear 35 per cent, and seines 20 per cent.

The main management tool of the state since 1960 has been to open and close seasons or areas as demanded by abundance or lack of salmon. In areas of clear water spawning streams this is based upon observed escapement. In the silty portion of the Inlet catch by week is compared with catches made for the same week of former years in order to establish the relative size of the salmon runs -- and this provides a basis for estimating escapement. Counting towers and test fishing are used in conjunction with these comparisons.

Little basic salmon research has been done in Cook Inlet. A federal aid research program has been approved to provide basic biological data on the Cook Inlet sockeye stocks. Research will continue on a sonar fish counting device that will count escapement into silty streams, and a racial study of sockeye of the Inlet will be made to determine, if possible, if the fishery can be managed to protect or harvest individual races. Estimates will be made of out-migrations of smolts, with the goal of forecasting returning runs of adults.

A pink salmon run forecast study, commenced in Cook Inlet in 1962, will be expanded and continued.

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INTRODUCTION

Alaska, as a state, has managed its salmon fisheries for six seasons. During this time the annual pack for the state has more than doubled the 1.7 million cases packed in the last year of federal management. In this six years a fresh approach to salmon management has been employed; fresh, that is, to Alaska. Basically this approach has stressed flexibility, with authorization for certain field personnel to open and close areas and seasons as conditions demand.

The Alaska Board of Fish and Game has fostered and strengthened this means of management, the authorization of which is in the law that established the Alaska Department of Fish and Game in the first State Legislature.

Six years is sufficient time for a realistic evaluation of the results. A direct comparison of state managed harvests with those made during the previous six years is the means used in this report to make this comparison.

This report will also make available for the first time in coherent form data on the Cook Inlet-Resurrection Bay fishery frequently requested of the Department of Fish and Game by fishermen, processors, economists, legislators, and others.

THE MANAGEMENT AREA

The Cook Inlet-Resurrection Bay Management Area (hereafter referred to as the Cook Inlet Area) includes all waters of Cook Inlet and Resurrection Bay north of Cape Douglas at the northeastern edge of Katmai National Monument, and west of Cape Fairfield, including the Barren Islands. The area embraces approximately 50,000 square miles, a region about the same size as the state of New York.

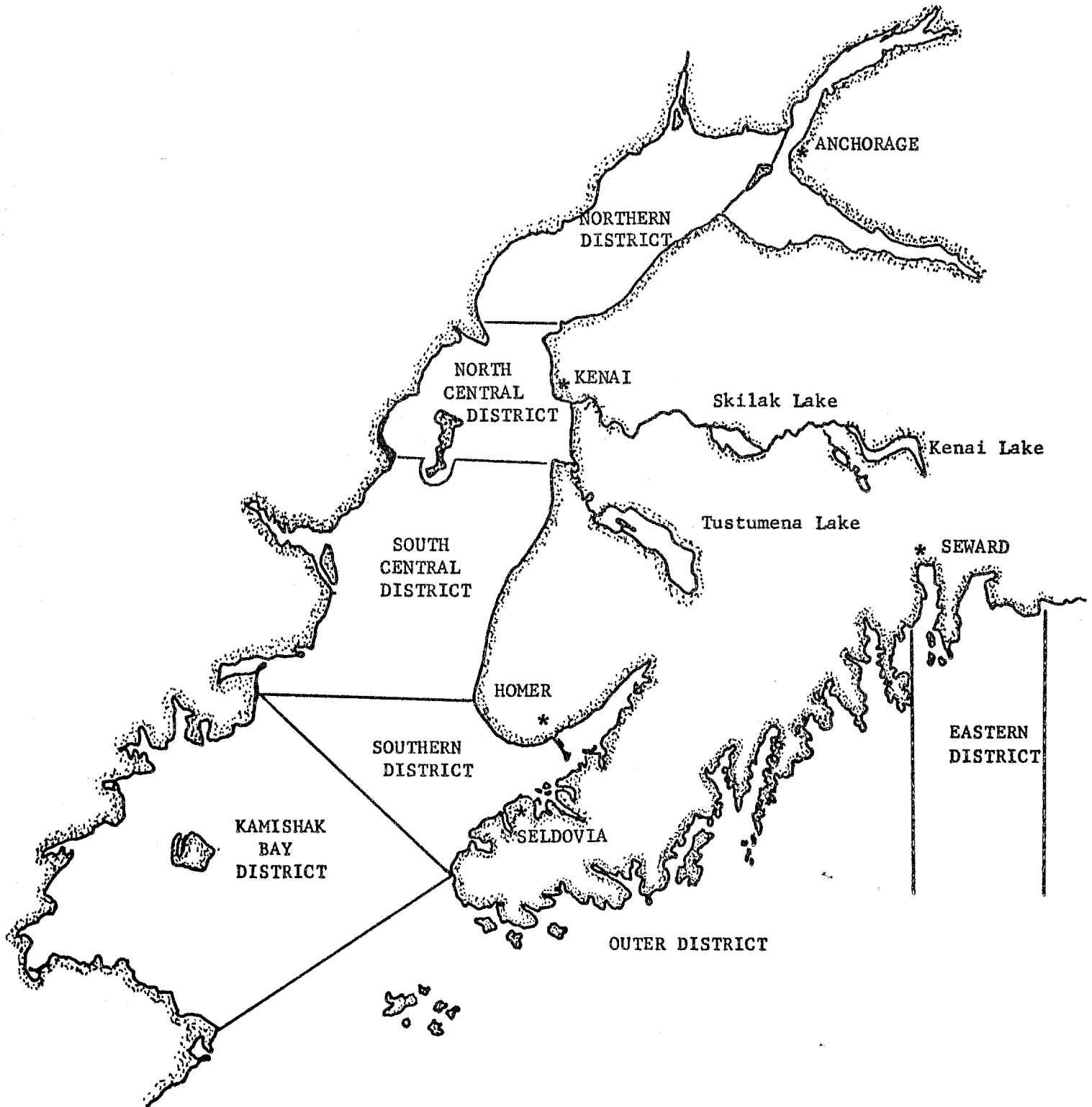
Since 1960 a commercial fisheries management staff of one Area Biologist and two Assistant Area Biologists have been charged with the management of all commercial fisheries within this area, including salmon, king and Dungeness crab, shrimp, razor clams, and fresh water species used for commercial purposes.

Temporary personnel authorized annually since 1964 include 5 man months allowed for test fishing, 19 man months for management purposes, and 3 man months for a single engine pilot.

FISHERMEN AND THEIR CATCH

An average of 1097 gear licenses were issued during the years 1960-65 (see Table 3), of which 602 were for set nets, 401 for drift nets, and 94 for hand purse seines. The approximately 150 fishermen in the Northern District comprise about 13 per cent of the Inlet's salmon fishermen, and since 1960 they have caught an average of 11 per cent of the Inlet's salmon. An average of 440 set netters and 401 drifters in the North Central and South Central Districts comprise approximately 77 per cent of the Inlet's fishermen, and since 1960 they have caught an average of 69 per cent of the Inlet's salmon. An average of 94 seiners and 12 set netters, or 10 per cent of the Inlet's salmon fishermen, caught an average of 19 per cent of Cook Inlet's salmon in the Southern, Kamishak Bay, Outer, and Eastern Districts between 1960 and 1965.

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES
COOK INLET - RESURRECTION BAY AREA



THE DISTRICTS

The Cook Inlet Area is divided into seven fishing districts, which, with one exception, have remained basically the same under state management as under federal jurisdiction: the one exception being the former Western District, which was combined with the present Outer District in 1961.

The salmon catch for the entire seven districts from 1954 to 1959 totalled 19,639,306: between 1960 and 1965 a total of 24,986,605 salmon were taken for an overall percentage increase of 27 (see Table 8).

Harvest of all species except for king salmon increased. The greatest increase of catch occurred with pink salmon, which rose from 8,591,764 to 11,960,393, for a 39 per cent rise.

Coho salmon increased by 30 per cent, from a 1954-59 catch of 1,206,095 to a 1960-65 catch of 1,571,599. Reds increased 24 per cent, from 5,407,679 to 6,695,537. The least increase in catch was shown by chums, which increased by 12 per cent from 4,178,237 to 4,660,969.

The Northern District, all the waters of which are silty, include that area north of Boulder Point, excluding Turnagain and Knik Arms. Of the approximately 150 set netters within this district about 142 are resident and 8 are non-residents (figures in this report referring to numbers of fishermen are for gear license holders only, and do not include helpers). No mobile gear has fished here since 1953; prior to 1953 drift nets were allowed throughout the district. The Northern District is the only one of the seven in the Cook Inlet Management Area which has no mobile gear.

Ten per cent more salmon were caught during 1960-65 than were taken from 1954-59 in this district. The greatest increase was in cohos, with 34 per cent more of this species taken during the past six years than during the period 1954-59. The greatest reduction was for king salmon, which decreased 68 per cent. Curtailment of king salmon fishing starting in 1961, and even greater curtailment starting in 1964, for conservation reasons, brought about much of the decline in king catch.

Fishermen of the Northern District rely heavily upon pink salmon, which come in strength only during even numbered years and comprise about 42 per cent of the catch, all years averaged. Next most important species is the red salmon, which comprises 21 per cent of the catch. Cohos are nearly as important as reds in this district, with 19 per cent of the catch being made up of this species.

There was little shift in the relative importance of species caught between the two periods being compared: cohos increased in relative importance by 3 per cent, while chums decreased by 3 per cent. Reds remained almost at the same relative importance. Kings, which comprised but 4 per cent of the total catch 1954-59, decreased in relative importance to 1 per cent of the total catch for the 1960-65 period.

The largest catch made in the Northern District during the 12 years was in 1964, when 1,041,704 salmon were caught. This figure would have been higher if canneries of the Inlet had been capable of processing fish at a faster rate; during the height of the 1964 season the cannery that processes the bulk of the

Northern District salmon required fishermen to limit their catches for about two weeks, at a time when a strong run of pinks was available for harvest.

The smallest catch made in the Northern District during the 12-year period occurred in 1965 when approximately 66,539 fish were taken: it is probable that this is the smallest catch made in this district since the early days of the fishery. The small catch reflected weak chum and coho runs, the usual off year on pinks, and a weak run of red salmon into drainages of the Northern District. Coho and chum runs were weak throughout the Inlet in 1965, and runs of these species, particularly of chums, were weak throughout most of the Pacific Coast this year.

The greatest dollar value of the fishery to fishermen of the Northern District during the period under study occurred in 1964, when \$685,765 was paid to these fishermen for their salmon. The next greatest value (\$678,895) occurred in 1960, and the third greatest value (\$631,590) occurred in 1962. The average annual income for this district 1960-65 was \$431,000.

Parts of the Northern District are difficult to fish because of extreme tides that average close to 30 feet of change between high and low water. Mud flats extend for some miles at low water in the northern section of the district, and set nets fished over these flats are effective only about half of the time: the rest of the time they go dry. Further, particularly in the northern and western portions of the district, violent winds that funnel out of Turnagain Arm combine with the rapidly moving tidal waters to create severe wave conditions that can make effective fishing impossible.

Although the "Turnagain winds" do make fishing difficult at times, it appears that a combination of winds -- Turnagain winds included -- and large tides, may create conditions favorable for catches of salmon in this particular area.

The bulk of the salmon caught in the three major gill net fishing districts of the Inlet (which includes the Northern District) are typically taken during a relatively brief time. During some salmon seasons 60 per cent or more of the entire Inlet gill net catch may be taken during two or three 24-hour fishing periods.

If wind, tide, salmon, and fishing time do not occur simultaneously in the correct combination a small segment of the fishery on the northwest shore of this district can fail.

Major drainages of the Northern District include the Chuit River, Beluga River, the Susitna River, the Little Susitna River, Fish Creek (Knik Arm) that drains the Big Lake system, the Matanuska River, Swanson River, Resurrection Creek, and Chickaloon River. Of these, the Susitna River is by far the largest and has the greatest potential for salmon production. An impassible barrier exists about 130 miles up the Susitna River at Devils Canyon, and salmon are not found beyond this point. Vast areas that are probably suitable for spawning exist above Devils Canyon, but the cost of making this area available to salmon will probably prohibit development, at least for some years, of the area into salmon production. Presently Devils Canyon is a site favored for construction of a power dam.

The Susitna River itself is silty, and many of the streams feeding it are silty; it is impossible to observe salmon escapement into these streams. It is

highly probable that the vast drainage of the Susitna Basin presently available for salmon spawning is under-utilized for this purpose. Until a means of counting spawning runs of salmon into silty streams is devised, estimates of the escapement of salmon into the Susitna and other silty drainages of Cook Inlet must be based upon the size of the commercial catch, and upon test fishing at or near the mouths of such streams during salmon runs. Since 1964 approximately 26.5 man months of management annually has been devoted to the Northern District.

The North Central District includes the area between the latitude of Boulder Point and the latitude of the marker at the south limit of the closed area at the Kasilof River, including the waters adjacent to Kalgin Island.

The South Central District includes that area between the latitude of the marker at the south limit of the closed area at the Kasilof River and the latitude of Anchor Point, excluding the waters adjacent to Kalgin Island.

For purposes of this report these two districts are considered together. Salmon harvested in these districts are of the same stocks, and primary fishing gear for both districts includes both set net and drift nets. Drifters frequently fish near the boundary between these districts, and then arbitrarily indicate one district or the other as the source of their catch. Further, depending largely upon tides and weather, the drift catch varies from year to year between these districts.

Of the average of 440 set net fishermen and 401 drifters who fished these districts 1960-65, about 703 were residents and 138 were non-residents. From two to six seine boats commonly fish for about two weeks annually in Chinitna Bay, the only portion of these districts open to seining.

Between 1960 and 1965 an average of 69 per cent of the salmon taken in the Cook Inlet Area were caught in these two districts, while between 1954 and 1959 the average was 62 per cent of the total.

Twenty-nine per cent more fish were caught in these districts between 1960 and 1965 than were taken 1954-59. The greatest increase was realized in pinks, with 39 per cent more individuals of this species taken during the past six years than during 1954-59. As expected, the greatest percentage reduction was for king salmon, which decreased 61 per cent.

Pink salmon made up 37 per cent of the total catch for the years 1960-65, and 35 per cent of the 1954-59 catch. Red salmon for the six years 1960-65 almost equalled pinks in total numbers, comprising 36 per cent of the total: chums are the third most important species for these districts, making up 20 per cent of the catch 1960-65.

There was little shift in the relative importance of species caught between the two six year periods: chums decreased from 22 per cent to 20 per cent, pinks increased from 35 per cent to 37 per cent, while cohos and reds remained virtually the same in relative importance.

The largest catch made in the North Central and South Central Districts during the 12 years under consideration was in 1964 when 4,697,570 salmon were caught. This figure would be higher, but canneries in the area, for various reasons, refused to purchase fish caught during the peak of that season.

The smallest catch was made in 1959, when 802,651 salmon were caught.

The greatest dollar value for these two districts occurred in 1962, when approximately \$3,385,969 was paid to fishermen of these districts for their salmon, and the least dollar value occurred with the small catch of 1959 when \$943,270 was paid to fishermen. The average gross amount paid fishermen in these districts 1960-65 was \$2,406,000.

Normally, most waters above the latitude of Ninilchik are silty, which makes gill net fishing in these waters quite effective. The normal summer winds are from the southwest, with only occasional northerly winds. Tidal rise and fall within these districts varies from about 18 feet to nearly 24 feet in the northerly section of the North Central District.

Salmon move through the North Central and South Central Districts in a generally predictable pattern. Chum salmon are rarely caught on the east side beaches, for example. Some tide rips, up which salmon move in some concentrations, harbor more red salmon than chums, and vice versa.

All five species of salmon may be found in these districts simultaneously, but each species has a normal period of greatest abundance. The early kings can be expected in late May: these fish are bound mostly for the Susitna River and other drainages of the Northern District. Early red salmon (locally called "bluebacks") bound for the Kasilof River, and apparently for some minor systems along the east side of the Northern District, appear in early June, and run until the third week of that month.

Shortly after June 25 red salmon increase rapidly, reaching a peak in abundance usually between about July 18 and 22. The red salmon are followed by the chums, and the chum run peaks within a very few days of the peak of the red run. In years of great abundance of pinks, they are found in large numbers from about July 18 until after July 25: during some years pinks continue to arrive in strength into the first week of August.

Coho salmon peak in late July in these districts, and this species continue to appear in decreasing numbers throughout the fall months. Fresh run fish of this species may be found in these districts as late as December.

A high percentage of the total catch in these two districts may be made during two or three single 24-hour fishing periods after about July 15, particularly in odd-numbered years when few pink salmon are taken: it is not uncommon for 60 per cent of the catch for these districts to be made during two or three such fishing days.

The proportion of catch varies between set net and drift gear, depending largely upon weather, tides, and the species of fish involved (see Table 1, Percentage of Catch by Gear). In years when strong southwesterly winds and large tides occur, red salmon bound for the Kenai and Kasilof Rivers are pushed onto the beach and/or into the Northern District, from whence they follow the beaches attempting to find their home streams: at such times the set net gear on the east side beaches make large catches, and drift catches fall off.

TABLE 1

PERCENTAGE OF COOK INLET SALMON CATCH BY GEAR, 1945-1964

	<u>1945</u>	<u>1946</u>	<u>1947</u>	<u>1948</u>	<u>1949</u>	<u>1950</u>	<u>1951</u>	<u>1952</u>
Seine	33	28	22	12	12	7	12	23
Drift			.17	5	21	34	37	23
Set Net	23	28	31	36	26	22	21	26
Trap	44	44	46	47	41	37	30	28
	<u>1953</u>	<u>1954</u>	<u>1955</u>	<u>1956</u>	<u>1957</u>	<u>1958</u>	<u>1959</u>	<u>1960</u>
Seine	20	8	42	6	20	23	14	17
Drift	31	24	29	33	47	23	31	26
Set Net	34	36	16	30	24	35	55	57
Trap	15	32	13	31	9	19		
	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>				
Seine	18	30	19	19				
Drift	50	25	46	35				
Set Net	32	45	35	46				

Chinitna Bay, on the southwesterly corner of these two districts, has clear water, and catches there are largely chums, which seem to move into this bay briefly before continuing on up the Inlet. Red salmon and coho salmon are taken in fair numbers here also.

Strong tidal action along the beaches of much of these two districts makes it difficult for fishermen to anchor set nets offshore. However, a few locations on the east side beaches between Ninilchik and Cape Kasilof (locally called "Humpy Point") permit use of offshore nets. The largest concentrations of such nets is found from the northerly marker at the mouth of the Kasilof River to the north. Few offshore nets are seen north of the Kenai River to Boulder Point, the northerly boundary.

During the normal season drift fishermen usually start fishing east of Chisik Island, and as the season progresses, they move east and north, following concentrations of fish, until during the latter part of the run, the bulk of drift fishing boats are almost wholly within the North Central District, east of Kalgin Island. Many drifters find it worthwhile to drift as far north as the Boulder Point boundary.

The Kenai and Kasilof Rivers are the most important drainages in these districts, and they are the sole important drainages utilized by commercially exploited salmon on the east side of these districts. The Kenai River is probably the most important producer of red salmon in the Cook Inlet Management Area. Kalgin Island stream supports a small run of reds. On the west side of the Inlet at least six drainages support small runs of red salmon, while all told about 14 different streams on the west side of these districts contribute salmon of various species and numbers to the commercial fishery.

Since 1964 approximately 16.5 man months of management effort annually has been devoted to the North Central and South Central Districts.

The Southern District consists primarily of Kachemak Bay, and includes Port Graham and Seldovia Bay. About 12 set net fishermen fish for salmon within the Southern District at Port Graham, Seldovia Bay, Barabara Point to Kasitsna Bay, and at Halibut Cove. In addition the highly mobile seine fleet harvests the bulk of salmon taken here: during a season anywhere from 10 to 50 seiners may be found within this district.

Since 1960 an average of 7 per cent of the salmon taken in the management area has been caught in the Southern District; between 1954 and 1959 an average of 9 per cent of the fish were taken here. A decrease of 10 per cent in the size of catch from the 1954-59 period occurred during the years 1960-65. Fewer salmon of all species except for pinks were taken; the pink catch increased by 13 per cent, while the chum catch was reduced by 89 per cent, the coho catch by 21 per cent, the red catch by 40 per cent, and the king catch by 90 per cent.

A considerable shift in relative importance of species occurred in the Southern District between the periods under consideration. Pink salmon comprised 73 per cent of the 1954-59 catch, while between 1960-65 they comprised 91 per cent of the catch. Chums dropped from 18 per cent to 2 per cent. Reds dropped from 8 to 5 per cent.

The reduced catch as well as the shift in relative importance in species for 1960-65 is at least a partial reflection of the elimination of the very effective Bluff Point trap.

The average annual value of salmon caught in the Southern District 1960-65 was about \$133,000: the average value 1954-59 was \$137,000.

Today the set net fishermen of this district catch most of the red salmon, while the seiner relies mostly upon pink salmon. The reds taken here for the most part are bound for streams further up the Inlet. Pinks are bound mostly for Port Graham stream, Seldovia River, Tutka Bay Lagoon stream, China Poot stream, and Mallard Bay stream -- all productive clear water drainages within the district.

Since 1964 approximately 10 man months of management and research (4 months research) effort annually has been devoted to the Southern District.

The Kamishak Bay District includes the area from near the south entrance to Chinikna Bay south along the coast to Cape Douglas, which is within the northeast section of the Katmai National Monument. No complete marine charts are available for this uninhabited, reef and rock-strewn area. High winds accompanied by heavy seas are common. It is a difficult area in which to travel, much less fish, and few fishermen are willing to venture into the area for salmon. Cannery operators are reluctant to provide tender service for fishermen in the area when tenders can be used to haul fish from other districts.

Seines are the only type of salmon gear used. During 1954 and 1958 no salmon fishery existed in the district. Since 1960 the district has produced an average of 1 per cent of the total fish caught in the Cook Inlet management area. Forty-nine per cent of these fish were pinks and 49 per cent were chums.

The average annual value of the catch from this district 1960-65 was \$21,500; the average 1954-59 was \$7,000.

This district is unquestionably the most difficult of the seven within the management area to fish for salmon. At least half of a fisherman's time is spent awaiting weather. Because of the light fishing pressure, and the constant weather problem it has been the policy of the Board of Fish and Game to allow seven day a week fishing within this district for the past several years. With few exceptions no stream markers are posted. If a harvest of salmon is to be taken from the district fishermen need every possible advantage.

Major drainages within the district include Kamishak River, Little Kamishak River, Strike Creek, McNeil River (famous for brown bears, and a bear refuge where observers may see bears fishing for salmon), Chenik stream and lake, Amakdedori stream, Bruin Bay stream, Cottonwood Bay stream, and Iniskin Bay stream. Normally the chum run at McNeil River arrives about July 10. After that pinks arrive at other systems from Rocky Cove south. By late July and early August chums arrive at Cottonwood and Iniskin Rivers, with fresh fish arriving well into September in most years.

Some drainages of the district are silty -- as Kamishak and Little Kamishak Rivers. McNeil River may become muddy with heavy rains. Iniskin and Cottonwood Bays are often silty, making it difficult to see fish for seine operations.

Since 1964 about half a man month of salmon management effort has annually been devoted to the Kamishak Bay District.

The Outer District includes that stretch of coastline from Point Adam, at the very southwest tip of the Kenai Peninsula, to the latitude of Bear Glacier, which is adjacent to Resurrection Bay. This is an area of many fiord-like bays and short, often precipitous streams, some of which are glacier fed.

Seines are the single type of salmon gear allowed, and probably most of the seine fishermen who license in Cook Inlet fish at least part of each season in the Outer District. Since 1960 the Outer District has produced an average of 11 per cent of the total numbers of individual salmon caught in the Cook Inlet Area: during 1954-59 it also produced an average of 11 per cent of the salmon.

Sixty-nine per cent more salmon were caught in this district between 1960 and 1965 than during 1954-59. Pinks (81 per cent), and chum salmon (18 per cent) are the important species for the district. The relative importance of the various species changed very little between the two periods under consideration.

Pink salmon production in the Outer District for the 1965 season was adversely affected by the March 27, 1964 earthquake. It is expected the 1967 chum run will also be weak as a result of the earthquake.

The average value of the salmon catch in this district to fishermen 1960-65 was \$287,000; 1954-59 average was \$151,000.

The most productive area in the Outer District is Port Dick, followed by Windy and Rocky Bays, Port Chatham, the Nuka Island area, and Aialik Bay.

Because the highly productive streams are clear, and salmon may be observed during aerial surveys, the Outer District lends itself to relatively intensive management methods. When spawning escapement is judged sufficient, surplus fish can be harvested: when escapement is weak, the area can be closed to fishing. Since 1964 approximately 6 man months of salmon management and research time annually has been devoted to the Outer District.

The Eastern District is the least important commercial salmon producing district in the management area: it extends from the latitude of Bear Glacier (where it adjoins the Outer District), includes all of Resurrection Bay and Day Harbor, and ends at the latitude of Cape Fairfield, which is the easternmost boundary of the management area. There are few streams within the district, and these produce mainly pink, chum, and coho salmon. A small run of red salmon is found at Bear Lake at the head of Resurrection Bay. Seines and troll gear only are allowed for the taking of salmon.

The few commercial salmon fishermen who fish from Seward rely mostly on the Outer District, and expect to return to Seward and "scratch" fish for silvers and late pinks and chums in Resurrection Bay in late August and into September.

In recent years large numbers of sports fishermen have harvested a high proportion of the silver salmon entering Resurrection Bay; prior to 1960 this fishery was virtually non-existent. This shift in fishing pressure from commercial to sports type gear, and the availability of better fishing in the Outer District and other areas of Cook Inlet has caused most of the Seward salmon fishermen to all but abandon the Eastern District during most of the salmon season in late years.

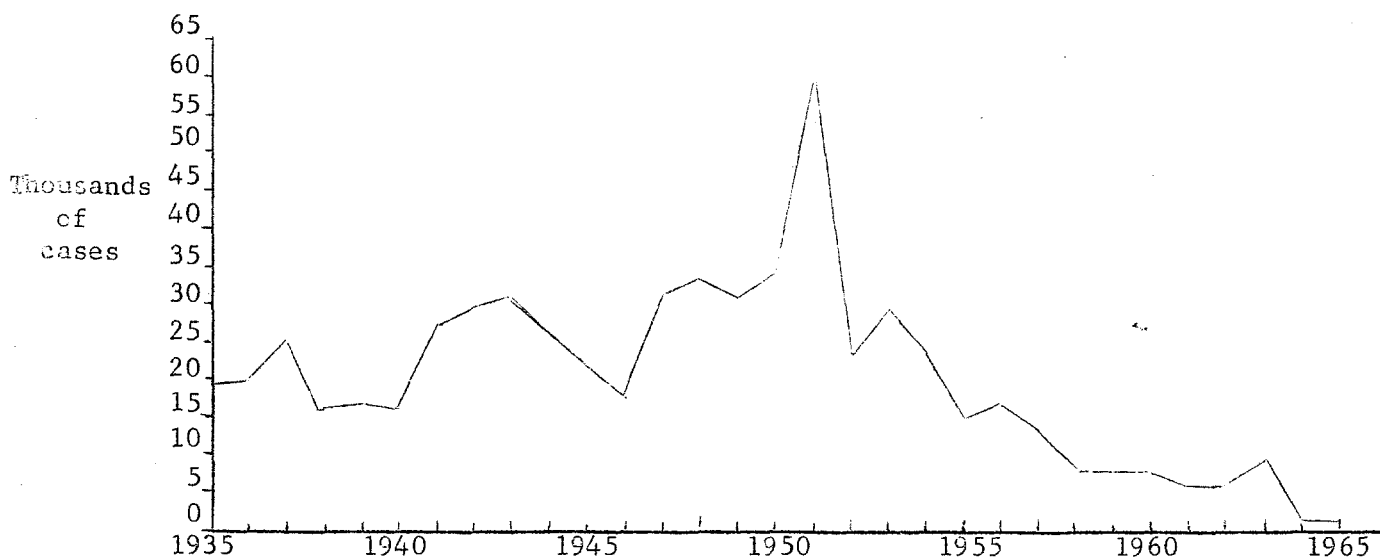
Since 1960 the area has produced an average of but .3 per cent of the total fish taken within the management area; during 1954-59 it produced an average of .9 per cent. The average annual value of commercially harvested salmon sold in the district since 1960 was \$1,950; the average 1954-59 value was \$14,000.

Since 1964 approximately one-half a man month of salmon management has annually been devoted to the Eastern District.

THE SALMON

King Salmon: Between 1930 and the early 1950's the king salmon was important to the Cook Inlet commercial fishery. The peak catch of kings occurred in 1951 when approximately 187,000 fish were caught. The decline in abundance of this species in Cook Inlet immediately followed the 1951 peak catch, and the decline continued without interruption until 1961 when the Board of Fish and Game curtailed fishing time. Escapement and catch studies in 1961, 1962, and 1963 indicated that stringent curtailment of the catch was mandatory in order to rehabilitate the sorely depleted runs. It was estimated in 1963 that king salmon stocks of Cook Inlet as a whole were reduced to approximately one-third of the level of the 1930's and 1940's. Effective in 1964 the Board of Fish and Game set the opening date of commercial salmon fishing in Cook Inlet so that an estimated 90 per cent of the king run would be protected -- they were on the spawning grounds by the time the season opened.

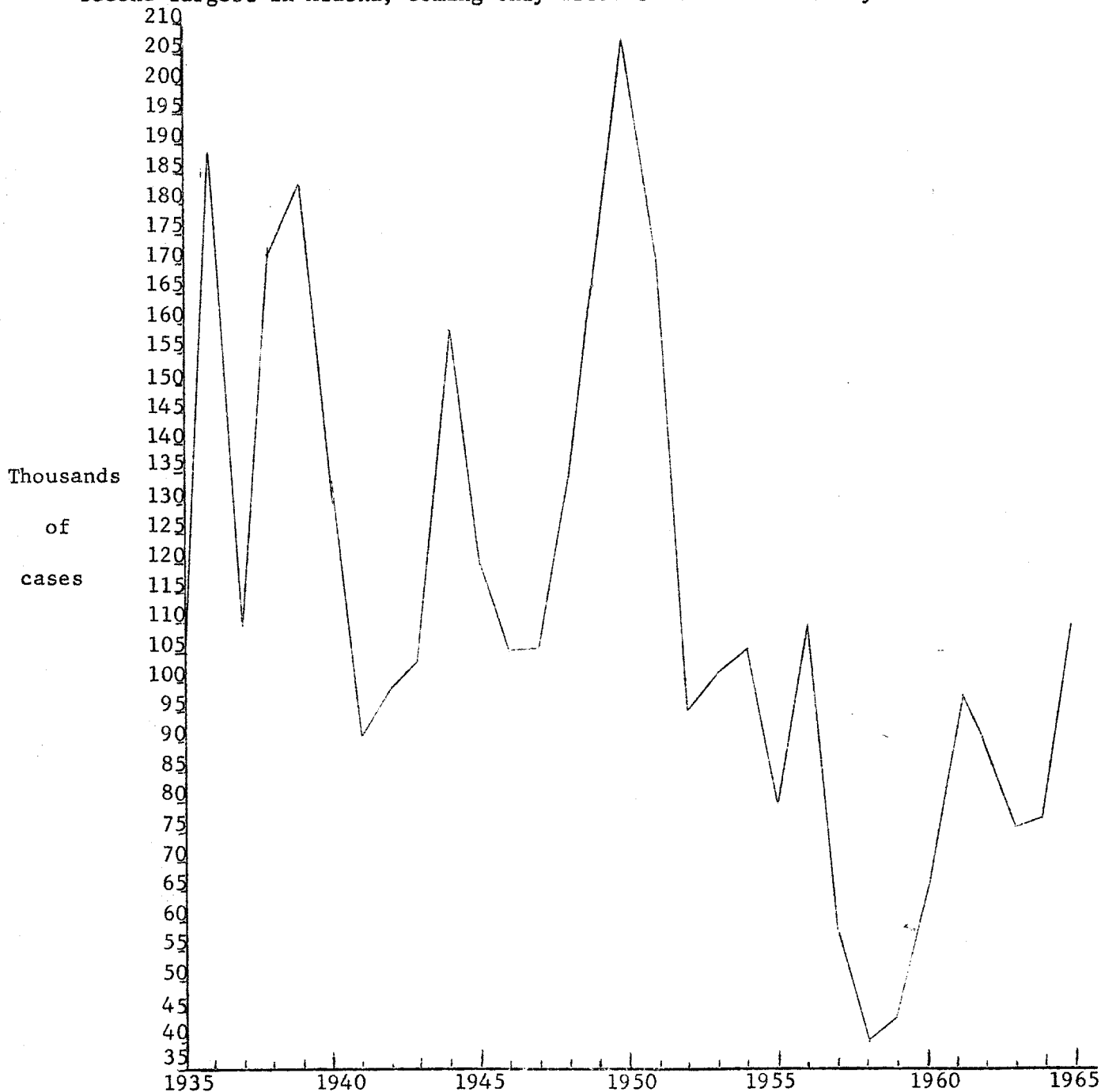
The early run of king salmon of the Inlet is bound largely for drainages above the Forelands -- the Susitna River primarily, but including Beluga River, Matanuska River, and other systems. King salmon caught after the opening date's for commercial fishing, June 25 and 24 (for the years 1964 and 1965) are bound mainly for the Kenai and Kasilof Rivers. The bulk of these fish are taken in the North Central and South Central Districts. These "July kings" or "leatherbellies" as they are commonly called, are generally not considered top quality by processors. Fewer than 300 kings are normally caught in the Northern District incidental to the catch of other species after June 25.



COOK INLET KING SALMON PACK IN CASES
1935-1965
(1 case = 48 one pound tall cans)

About 50 per cent of Cook Inlet king salmon are five year old fish and about 35 per cent are four year old fish. Re-building king salmon stocks in the Inlet can be expected to take some years.

Red Salmon: The red salmon is generally considered to be the most valuable species in Cook Inlet, and most management practices have been directed toward it. The first commercial fishing operation in Cook Inlet was in 1893 when a catch of 170,000 reds was made. In recent years the Inlet red catch has been second largest in Alaska, coming only after that of Bristol Bay.



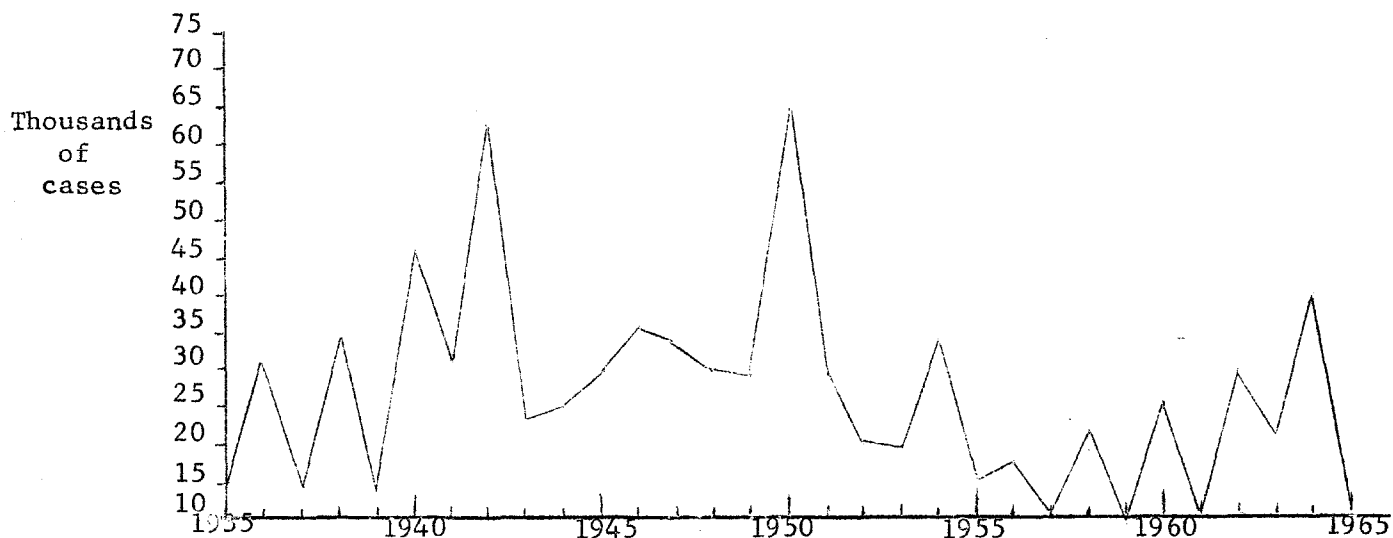
COOK INLET RED SALMON PACK IN CASES
1935-1965
(1 case = 48 one pound tall cans)

The trend of the Inlet red salmon pack has been upward since 1958.

The major red salmon producing drainages of Cook Inlet are the Kenai and Kasilof Rivers, in that order. A combination of the Susitna River, Beluga River and the Fish Creek (Knik Arm) also provides a run of red salmon that creates a commercial fishery for this species in the Northern District. In addition there are numerous smaller drainages from the latitude of Chisik Island north that support runs of red salmon: in combination these many small streams probably produce an appreciable proportion of the red salmon catch. One result of the multiple drainages producing red salmon in Cook Inlet is that many races of red salmon occur. Considerable size and body variation can be found in the usual red salmon catch of the Inlet.

Normally about 60 per cent of Cook Inlet reds are five year old fish, from 15 to 20 per cent are four year old fish, and less than 20 per cent are 6 year olds.

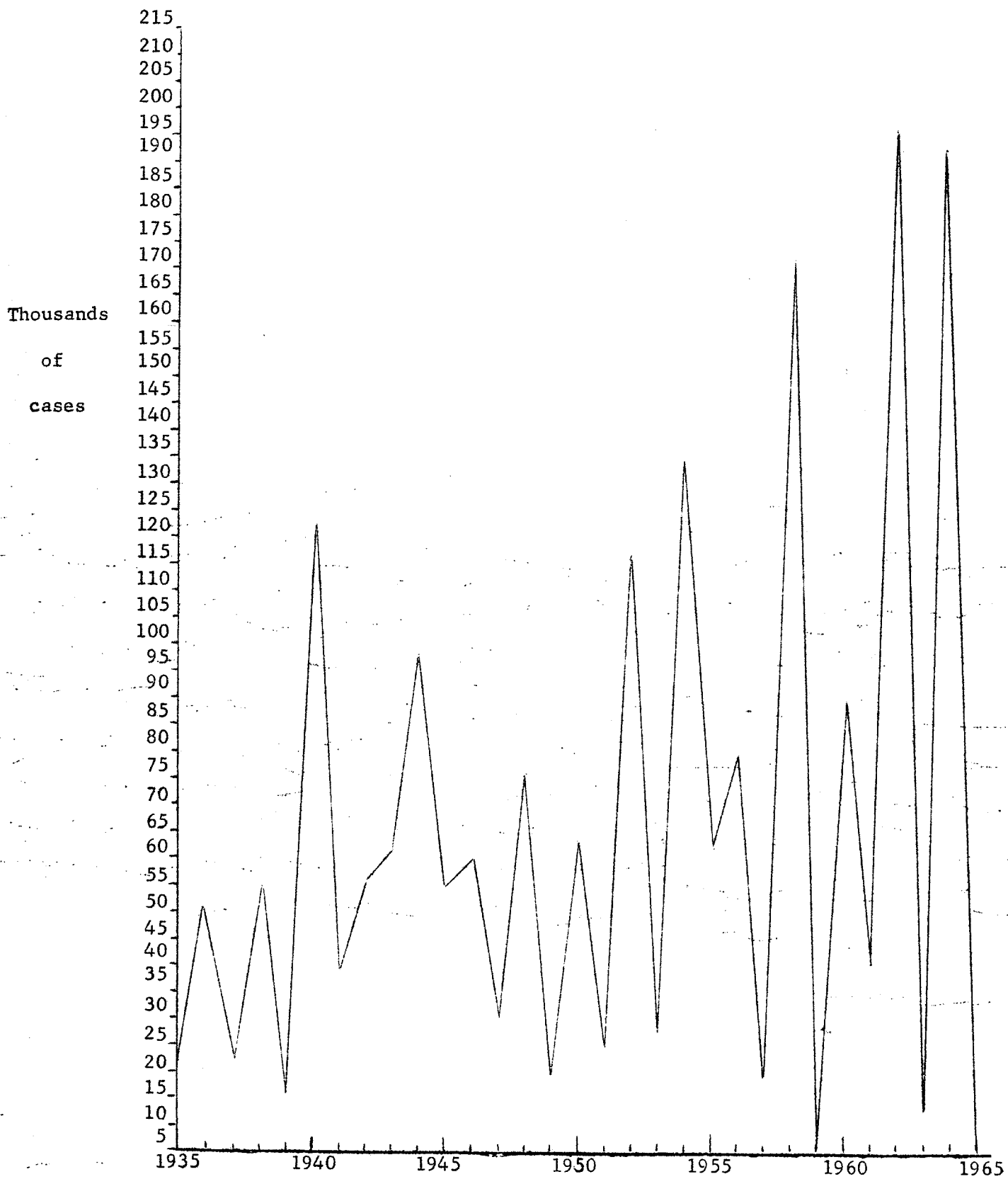
Coho Salmon: The coho pack for Cook Inlet is characterized by an even-odd year fluctuation nearly as marked as that for pink salmon, with the strong runs occurring on even years. Since 1960 59 per cent of the Inlet cohos have been taken in the North Central and South Central Districts, and 39 per cent in the Northern District.



COOK INLET COHO SALMON PACK IN CASES
1935-1965
(1 case = 48 one pound tall cans)

Cook Inlet cohos are normally four year fish. The peak pack of this species in recent years was in 1950 when 63,000 cases were packed. During the late 1930's the average coho pack was about 45,000 cases. After 1952 the pack gradually decreased to a low of about 9,000 cases in 1959. Since then the pack has gradually increased until 1964, when 39,300 cases were put up.

Cohos offer some opportunity for late fall and early winter fishing, particularly during even year runs, after the major canneries of the Inlet close. Cohos run far later than any other species in Cook Inlet, with fresh fish reported as late as December.



COOK INLET PINK SALMON PACK IN CASES.
1935-1965
(1 case = 48 one pound tall cans)

Pink Salmon: Pink salmon, which are abundant during even numbered years in Cook Inlet, were relatively unimportant in the Cook Inlet pack of the late 1930's with about a 40,000 case average during those years. In 1940 a peak of over 120,000 cases was established, but between that year and 1952 the pack ran somewhere between 60,000 and 80,000 cases, with highs and lows above and below these figures. Since 1952 the even year pink pack has increased steadily. In 1958 a pack of over 160,000 cases was put up, and in 1962 the record pack of 210,000 cases was made in Cook Inlet. The 1964 pink pack was 188,000 cases.

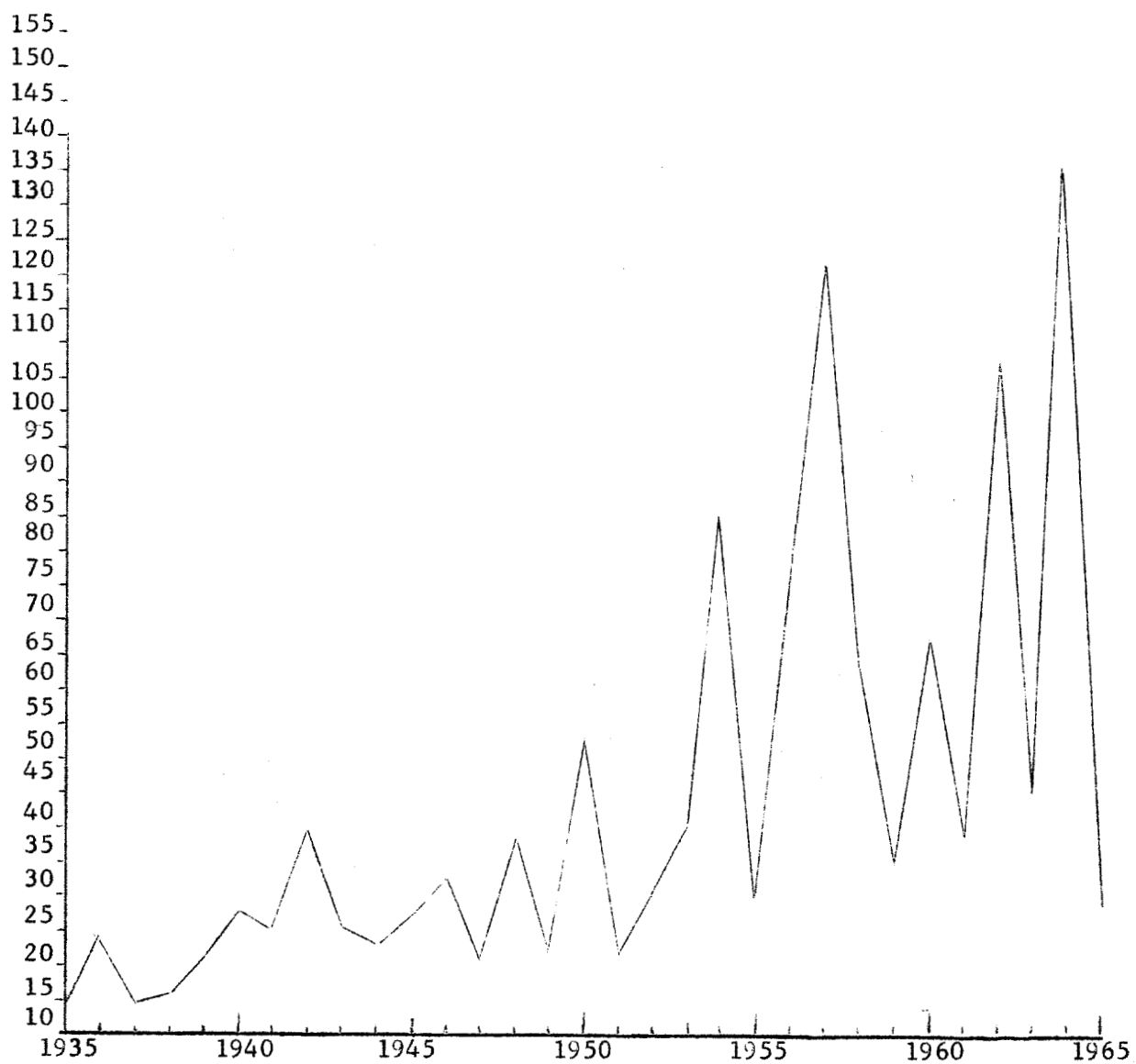
The tremendous numbers of pink salmon that arrive in upper Cook Inlet during even numbered years tend to mask catch figures for other species. For example, but a few thousand pinks can be expected to be caught in the Northern District during odd-numbered years, yet the great abundance during even years builds a catch that averages 42 per cent pinks over the six year period. The largest number of pinks are taken in the North Central and South Central Districts, followed by the catch of the Outer District, the Southern District, and then the Northern District. Pinks utilize both small and large drainage systems for spawning, and this species is found in practically every suitable spawning stream of the Inlet. The Talachulitna River, a clearwater, 35 mile long, tributary to the Susitna River, is probably the major producer of pink salmon above the Forelands. The Kenai River is another large river that supports huge numbers of spawning pink salmon.

The arrival of vast numbers of pink salmon about July 20 during even-numbered years has caused over-supply problems in Cook Inlet: if a strong run of reds, chums, and cohos appear at the same time, processing facilities may literally be overwhelmed.

Chum Salmon: The chum pack for Cook Inlet has increased markedly in recent years. The 1964 chum pack was the largest ever packed in the Inlet, with a total of nearly 136,000 cases. In the late 1930's the annual chum pack for the Inlet was approximately 20,000 cases. From 1940 to 1950 it averaged somewhat over 30,000 cases. From 1950 through 1964 it increased rapidly, with large packs in 1954, 1957, 1962, and the largest ever, in 1964.

No explanation is available for the drop in the chum catch for 1965: chum runs throughout the Gulf of Alaska, and indeed, the entire Pacific Coast, were weak during this year. It is also interesting to note that Cook Inlet chums during 1965 were smaller than normal.

The majority of chum salmon taken in Cook Inlet are 4 year fish.



COOK INLET CHUM SALMON PACK IN CASES
1935-1965
(1 case = 48 one pound tall cans)

TABLE 2

SALMON PER CASE, COOK INLET, BY CANNERY, 1960-1964

YEAR	KINGS	REDS	COHOS	PINKS	CHUMS
<u>Cannery #1</u>					
1960	3.5	13.0	13.5	23.0	12.0
1961	2.993	11.367	11.368	18.149	11.12
1962	3.25	11.9	13.6	24.5	10.7
1963	No record				
1964	--	12.457	13.322	22.037	9.254
<u>Cannery #2</u>					
1960-62	No record				
1963	--	13.2	10.3	22.0	11.1
1964	--	14.3	9.5	20.3	9.3
<u>Cannery #3</u>					
1960	No record				
1961	3.68	11.86	9.56	18.98	11.16
1962	4.77	13.33	10.57	20.98	9.71
1963	4.63	13.30	9.36	24.12	10.38
1964	3.85	14.0	9.65	20.3	8.85
<u>Cannery #4</u>					
1960	3.52	15.65	26.67	13.07	11.52
1961	3.515	12.39	12.083	24.876	10.576
1962	3.1	13.6	9.17	22.457	8.76
1963	3.63	13.04	10.43	28.75	10.37
1964	3.276	12.997	11.72	21.924	9.564
<u>Cannery #5</u>					
1960	--	13.42	11.03	25.16	11.38
1961	--	11.61	11.74	17.42	10.57
1962	4.69	12.4	12.73	26.82	10.42
1963	--	12.093	10.513	24.156	10.558
1964	--	12.37	12.53	22.62	9.27
<u>Cannery #6</u>					
1960-61	No record				
1962	--	12.08	11.50	24.21	9.61
1963	--	12.86	10.25	23.56	10.56
1964	--	12.25	11.37	21.02	9.55
<u>Cannery #7</u>					
1960-63	No record				
1964	9.0	16.2	9.1	21.4	--

ECONOMICS

Many of Cook Inlet's commercial salmon fishermen use salmon fishing as "vacation" employment. No figures are available to show how many of the salmon fishermen of the Inlet depend exclusively upon commercial fishing for their livelihood.

Cook Inlet, in common with many other salmon fishing areas in Alaska, has too many salmon fishermen; or, too much gear is being fished for salmon. Since 1952 salmon fishing during the major part of the run has been held to two 24-hour fishing periods a week. If more fishing time were allowed there would be a very real danger that all-important spawning escapement would not be achieved. There is so much gear in the gill net fishery that it is conceivable that during any 24-hour fishing period, unusual circumstances could combine to allow a catch that could be damaging to the future of the fishery -- and the evidence of this happening would not be available until after such catch was made.

Also, under this system, there are five days a week in which no extensive information on numbers of salmon present in the silty waters of the Inlet is available.

Because of the two day a week fishery, canneries must handle large quantities of fish at a time -- and oft-times they lay idle awaiting another glut of fish. This is inefficient use of equipment, and it does not produce the best possible quality food product. When unusual quantities of fish become available, the Inlet canneries may experience great difficulties in attempting to handle runs of this size, as happened in 1961 and 1964.

During years of weak pink and coho runs (odd-numbered years) canneries may not be able to buy sufficient salmon for a profitable operation.

Because there are so many fishermen to share in the Inlet's catch, the individual share is small, and many fishermen who have considerable investment in boats, gear, or fishing sites, find they cannot make a living at salmon fishing alone, as was once the case. (Table 6 shows the average annual income of Cook Inlet salmon fishermen by gear.) From 1959 through 1964 the annual average earning of a salmon gear license holder in Cook Inlet was \$3,313.

Because fishermen are not making enough money to live on, frequent protests are registered against closures or curtailment of fishing time. It is difficult to think of a distant future when you aren't sure you will be able to pay today's bills. Most of the pressures exerted by commercial fishermen on the commercial fisheries management staff of this area, and on the Department of Fish and Game, is a result of this situation.

The economy of the local area is not helped when money earned by fishermen is taken out of the state. Non-Alaskan fishermen are in the minority in Cook Inlet, but there are enough non-residents fishing and taking their earnings out of Alaska to cause concern: in 1962 non-resident fishermen caught 13 per cent of Cook Inlet's salmon, in 1963 they took 28 per cent, and in 1964 approximately 20 per cent. (See Table 4, Percentage of Salmon caught by Resident and Non-resident Fishermen.) Three years are too few to determine if a trend exists (catch by individual fisherman is not available prior to 1962: at this writing statistics on the 1965 catch have not been completed), but it is interesting to

note that 1962 and 1964 were similar years in size of catch and in amount of gear -- and that the non-resident catch increased in 1964 over that for 1962. The 1963 catch of 28 per cent by non-residents reflects the small seine catch for that year and the unusually high percentage of drift caught fish. The drift fishery, of course, includes in it the highest percentage of non-resident fishermen. (See Table 3, Gear Licence Sales, Cook Inlet.)

The economic ills of Cook Inlet's salmon fishery are not restricted to this area alone in Alaska, nor are these ills restricted to Alaska. No suggestions for solution are offered here.

Shift in Catch, by Gear: Prior to 1947 there was no important drift fishery in Cook Inlet. Once started drift gear increased rapidly, and 560, the maximum number ever, were recorded in 1951. The percentage of catch made by drift gear has fluctuated from year to year. Concurrent with the increase in drift gear, the percentage of salmon caught by traps decreased slightly. With the elimination of traps (last year fished in 1958), which averaged about 20 per cent of the catch 1954-58, the average percentage of salmon taken by set nets rose by 16, while the average percentage of drift gear catch increased by 4.

Since 1959, excluding 1965, for which exact figures are not available at this writing, set nets have taken an average of 45 per cent of the total Inlet catch, while drift gear has taken an average of 35 per cent of the catch. The seine catch during this period averaged 20 per cent. (See Table 1, Percentage of Cook Inlet Salmon Catch by Gear, 1945-64.)

TABLE 3

SALMON GEAR LICENSE SALES, COOK INLET, 1960-65

	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>SIX YEAR AVERAGE</u>
Set Gill Net: Resident	511	564	589	621	596	554	572)
Non-resident	<u>29</u>	<u>22</u>	<u>28</u>	<u>34</u>	<u>35</u>	<u>35</u>) 5% non-residents <u>30)</u>
Total	540	586	617	655	631	589	
Drift Gill Net: Resident	221	279	260	333	323	302	285)
Non-resident	<u>67</u>	<u>93</u>	<u>112</u>	<u>139</u>	<u>145</u>	<u>145</u>) 29% non-residents <u>116)</u>
Total	288	372	372	472	468	447	
Hand Purse Seine: Resident	86	85	84	102	102	65	87)
Non-resident	<u>9</u>	<u>4</u>	<u>7</u>	<u>10</u>	<u>6</u>	<u>6</u>) 7% non-residents <u>7)</u>
Total	95	89	91	112	108	71	

TABLE 4

PERCENTAGE OF SALMON CAUGHT BY RESIDENT AND NON-RESIDENT FISHERMEN

GEAR & YEAR	KING	RED	COHO	PINK	CHUM	TOTAL	ALL SPECIES, BY GEAR
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1962 - Percentage of total caught by resident fishermen - 87; by non-residents - 13.

SEINE:							
Resident	100	99	99	94	94	94	30%
Non-resident		1	1	6	6	6	
DRIFT NET:							
Resident	93	58	63	64	59	60	24%
Non-resident	7	42	37	36	41	40	
SET NET:							
Resident	94	96	92	97	91	96	46%
Non-resident	6	4	8	3	9	4	

1963 - Percentage of total caught by resident fishermen - 72; by non-residents - 28.

SEINE:							
Resident	95	97	97	91	87	90	19%
Non-resident	5	3	3	9	13	10	
DRIFT NET:							
Resident	67	46	48	41	46	46	46%
Non-resident	33	54	52	59	54	54	
SET NET:							
Resident	96	95	98	98	98	96	35%
Non-resident	4	5	2	2	2	4	

1964 - Percentage of total caught by resident fishermen - 80; by non-residents - 20.

SEINE:							
Resident	100	100	100	95	91	93	19%
Non-resident				5	9	7	
DRIFT NET:							
Resident	79	55	53	52	52	52	35%
Non-resident	21	45	47	48	48	48	
SET NET:							
Resident	93	94	95	94	97	93	46%
Non-resident	7	6	5	6	3	7	

TABLE 5

NUMBERS OF INDEPENDENT AND CANNERY-OWNED DRIFT AND SEINE BOATS
1961-65

	<u>1961</u>	<u>%</u>	<u>1962</u>	<u>%</u>	<u>1963</u>	<u>%</u>	<u>1964</u>	<u>%</u>	<u>1965</u>	<u>%</u>
Cannery-owned	130	33	141	35	154	30	159	31	154	33
Independent	<u>262</u>	67	<u>258</u>	65	<u>346</u>	70	<u>347</u>	69	<u>317</u>	67
Total Boats	392		399		500		506		471	

TABLE 6

AVERAGE GROSS INCOME OF INDIVIDUAL COOK INLET FISHERMAN, BY GEAR
(BASED ON PRICES PAID FOR RAW FISH AS REPORTED BY CANNERIES)

<u>1959</u>	
69 Seine	\$1,407.41
370 Drift	995.50
534 Set Net	1,768.71

<u>1960</u>	
95 Seine	3,496.40
288 Drift	3,129.08
540 Set Net	3,586.22

<u>1961</u>	
89 Seine	2,178.39
372 Drift	3,364.81
586 Set Net	1,523.24

<u>1962</u>	
91 Seine	12,286.40
372 Drift	4,142.05
617 Set Net	4,042.39

<u>1963</u>	
112 Seine	1,782.77
472 Drift	2,158.79
655 Set Net	1,377.28

<u>1964</u>	
108 Seine	5,537.01
468 Drift	3,529.74
631 Set Net	3,328.86

6 year average income - \$3,313.06 (all gear)

MANAGEMENT OF THE COOK INLET SALMON FISHERY

Under federal management Cook Inlet salmon seasons were set in advance, with occasional variations from these seasons when unusual conditions called for a change. Flexibility was minimal -- it was necessary for a new regulation to be printed in the Federal Register before a change could occur in a salmon season. This frequently took days, and by the time it was accomplished, often the occasion that had called for the change was altered. This was according to the federal law that the managing agency had to operate under, and it was a severe handicap.

In 1960 the state was charged with the management of its commercial fisheries. An invaluable tool provided to the state fisheries management program has been the power to open and close fishing periods and areas as dictated by on the spot observations. These openings and closures are promulgated at the local level and they can be made effective in a matter of hours, thus affording maximum flexibility, and giving the opportunity for increased harvests when sufficient stocks are present, and conversely, closures may be made rapidly when the situation demands. (See Table 7, Emergency Orders, Salmon, 1960-65.)

This procedure is handled in two ways in the Cook Inlet management area. In clear water areas, where escapement can be observed from low flying aircraft, seasons and openings have been based upon observed escapement. In the gill net fishery in the silty portion of the Inlet, where all major drainages are silty, direct enumeration of salmon escapement is impossible. During fishing season the catch made within this area during any given week is compared with catches for the same week of the year for previous seasons. A larger catch suggests a stronger run; a smaller catch suggests a weaker run. Weather, amount of gear, and of course, whether it is an even or an odd numbered year -- and the species of salmon involved -- must all be considered. During the normal several week build-up to a peak of this fishery a trend and a measure of strength of the run can generally be obtained by this "comparative" method of management. In essence, the entire fishery is acting as a test fishery, sampling the strength of the run.

Since catch by week figures are available for many years, and they are based upon a two day a week fishery, with known amounts of gear, a fairly solid basis exists for comparison.

At the same time that current catch figures are reviewed against previous year's figures, test fishing crews in the Kenai, Kasilof, and Susitna Rivers continually sample the runs of salmon entering these streams. Data provided by test fishing in this manner includes the species composition, and when the peak of abundance occurs for each species at the test fishing site. Total enumeration of salmon into these drainages cannot be obtained by test fishing.

Counting towers, where salmon are counted as they swim upstream, are located on two key streams: at Fish Creek on Knik Arm, and at Russian River, a major clear water tributary to the Kenai River. Counts of red salmon at these stations are figures that enter into any evaluation of the strength of Cook Inlet red salmon runs.

Management of the fisheries, using comparisons with past catches, plus data provided by test fishing and counting towers, obviously has many drawbacks. However, it does have the advantage of providing information immediately, at the time the fishery is active, and at a time when liberalization or restriction of the fishery can be of benefit.

A knowledge of the relative numbers of fish present in the Inlet during two 24-hour periods a week, as determined by the catch, gives a fair indication of escapement that is occurring into the silty streams of the Inlet during the remaining five days of the week.

One unfortunate aspect of this system is that it is difficult to depart from it: any considerable alteration of fishing time during the build-up of a run invalidates comparisons with past years' catch data.

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TABLE 7

NUMBER OF EMERGENCY ORDERS, SALMON - 1960-1965

YEAR	NORTHERN, N. CENTRAL, S. CENTRAL	SOUTHERN	KAMISHAK	OUTER	EASTERN
1960	4	7	3	11	
1961	4	4	2	7	1
1962	6	5	3	4	2
1963	6	8	3	1	
1964	6	4	2	5	1
1965	6	4	2	4	1

EXPLANATION OF TABLES 8 THROUGH 14

Unless otherwise stated, figures represent individual fish. Statistical Digest No. 50, "Alaska Commercial Salmon Catch Statistics 1951-59", United States Department of the Interior, Fish and Wildlife Service, Bureau of Commercial Fisheries, 1960, is the source for the catch data 1954-59. Statistical Leaflets #1, #3, #5, and #7, of the Alaska Department of Fish and Game, "Alaska Commercial Fisheries Catch" for the years 1960, 1961, 1962, and 1963, are the sources for the 1960-63 catch figures. Philip E. Chitwood, Supervisor of Statistics provided the 1964 figures, which will appear in Statistical Leaflet #9 due for publication shortly. The 1965 figures were reported to the Homer field office of the Department of Fish and Game by canneries of the Cook Inlet area during the 1965 commercial salmon fishing season, and these figures are probably only approximations.

Changes in district boundaries have been considered, and data are representative of the districts as defined in 1965.

"Percentage of Inlet Catch" (Tables 8 through 14) represents the relative importance of the catch for each district, by year, to the total or combined catch of all seven Cook Inlet management area districts.

"Dollars Paid Fishermen" is based upon the average prices paid to independent fishermen by canneries as follows:

YEAR	KING	RED	COHO	PINK	CHUM
1954	4.00	1.17	.80	.30	.40
1955	4.00	1.25	.90	.33	.40
1956	4.50	1.35	1.00	.40	.50
1957	5.00	1.40	1.00	.40	.50
1958	5.00	1.40	1.00	.45	.55
1959	5.00	1.40	1.00	.40	.50
1960	5.00	1.45	1.00	.47	.60
1961	5.00	1.45	1.00	.47	.60
1962	5.00	1.47	1.00	.47	.60
1963	5.00	1.47	1.00	.44	.60
1964	5.00	1.47	1.00	.35	.60
1965	5.00	1.47	1.00	.35	.62

"Percentage of Catch by Species" indicates the relative importance of each species by number of individual fish, for each of the two six year periods indicated.

"Percentage of Change" represents the percentage of change between 1954-59 and 1960-65, using 1954-59 as base. For example, the 27 per cent increase for the overall catch indicates that the 1960-65 catch was 19,639,306 plus 27 per cent of that figure, or 24,986,605.

TABLE 8

TOTAL CATCH, INDIVIDUAL SALMON, ALL DISTRICTS

COOK INLET - RESURRECTION BAY MANAGEMENT AREA 1954-65

<u>Year</u>	<u>Kings</u>	<u>Reds</u>	<u>Cohos</u>	<u>Pinks</u>	<u>Chums</u>	<u>Total</u>	<u>Amt. Paid Fishermen</u>
1954	65,325	1,246,672	336,685	2,460,051	775,659	4,884,392	\$3,037,533
1955	46,499	1,064,128	180,452	1,286,008	317,053	2,894,140	2,247,811
1956	65,310	1,295,095	207,534	1,803,295	870,269	4,241,503	3,406,259
1957	42,767	670,629	127,199	306,841	1,207,920	2,355,356	2,006,611
1958	22,847	496,842	241,561	2,598,314	596,179	3,955,743	2,548,514
1959	32,783	634,313	112,664	137,255	411,157	1,328,172	1,425,097
Total	275,531	5,407,679	1,206,095	8,591,764	4,178,237	19,639,306	\$14,671,825
% Catch by Species	1.4%	28%	6%	44%	21%		
1960	27,539	948,040	314,153	2,023,252	776,079	4,089,063	\$3,243,081
1961	19,778	1,185,079	119,397	337,394	405,221	2,066,869	2,338,359
1962	20,270	1,172,859	358,051	4,960,030	1,149,841	7,661,051	5,204,620
1963	17,632	958,101	203,876	234,052	525,537	1,939,198	2,118,749
1964	4,622	990,709	462,114	4,287,378	1,402,419	7,147,242	4,283,599
1965	8,266	1,441,749	113,008	118,287	401,872	2,083,182	2,564,270
Total	98,107	6,695,537	1,571,599	11,960,393	4,660,969	24,986,605	\$19,753,680
% Catch by Species	.4%	27%	6%	48%	19%		
Difference	-177,424	+1,287,858	+365,504	+3,368,629	+482,732	+5,347,299	\$5,081,855
% Change	Decrease 64%	Increase 24%	Increase 30%	Increase 39%	Increase 12%	Increase 27%	

TABLE 9

NORTHERN DISTRICT

<u>Year</u>	<u>Kings</u>	<u>Reds</u>	<u>Cohos</u>	<u>Pinks</u>	<u>Chums</u>	<u>Total</u>	<u>% of Inlet Catch</u>	<u>Amt. Paid Fishermen</u>
1954	22,585	120,508	139,464	347,040	84,571	714,168	14%	\$ 480,845
1955	20,522	52,927	46,365	3,226	40,321	163,361	6%	207,168
1956	18,457	114,612	80,322	398,851	169,545	781,787	18%	562,417
1957	21,422	90,431	44,416	1,678	101,454	259,401	11%	329,527
1958	9,308	69,222	100,813	408,043	92,227	679,613	17%	478,608
1959	13,222	134,930	41,230	2,348	50,699	242,429	18%	322,530
Total	105,516	582,630	452,610	1,161,186	538,817	2,840,759	Ave. 14%	\$2,381,095
% Catch by Species	4%	21%	16%	41%	19%			
1960	8,218	148,247	144,377	442,185	117,739	860,766	21%	678,895
1961	7,755	77,374	40,975	10,765	61,103	197,972	10%	233,633
1962	9,778	130,934	172,562	279,599	143,757	736,630	10%	631,590
1963	7,345	109,463	63,540	8,940	43,694	232,982	12%	291,325
1964	168	160,264	167,928	586,386	126,958	1,041,704	15%	685,765
1965	266	19,374	18,518	4,460	23,921	66,539	3.2%	64,719
Total	33,530	645,656	607,900	1,332,335	517,172	3,136,593	Ave. 11%	\$2,585,927
% Catch by Species	1%	21%	19%	42%	16%			
Difference	-71,986	+63,026	+155,290	+171,149	-21,645	+ 295,834	3%	\$ 204,832
% Change	Decrease 68%	Increase 11%	Increase 34%	Increase 15%	Decrease 4%	Increase 10%		

TABLE 10

NORTH CENTRAL & SOUTH CENTRAL DISTRICTS COMBINED							% of	Amt. Paid
<u>Year</u>	<u>Kings</u>	<u>Reds</u>	<u>Cohos</u>	<u>Pinks</u>	<u>Chums</u>	<u>Total</u>	Inlet Catch	Fishermen
1954	41,195	1,086,538	182,061	1,842,267	425,497	3,577,558	72%	\$2,304,557
1955	25,404	974,601	124,412	98,454	208,022	1,430,893	49%	1,547,536
1956	46,518	1,144,177	117,867	1,196,524	612,506	3,117,592	72%	2,656,699
1957	20,831	553,281	81,018	19,550	900,016	1,574,696	66%	1,417,594
1958	13,419	408,170	138,952	1,240,505	379,470	2,180,516	55%	1,544,420
1959	19,426	471,966	61,619	10,506	239,134	802,651	60%	943,270
							Ave.	
Total	166,793	4,638,733	705,929	4,407,806	2,764,645	12,683,906	62%	\$10,414,076
% Catch by Species								
	1%	37%	6%	35%	22%			
1960	19,294	785,292	167,125	981,465	542,258	2,495,434	61%	2,188,911
1961	11,982	1,084,929	76,803	23,252	288,525	1,485,491	72%	1,893,903
1962	10,432	1,016,639	177,762	2,432,090	864,177	4,501,100	59%	3,385,969
1963	10,191	833,517	133,600	21,496	343,333	1,342,137	69%	1,625,283
1964	4,363	809,791	285,713	2,645,575	952,128	4,697,570	66%	2,995,148
1965	7,994	1,409,975	92,375	4,500	343,148	1,857,992	89%	2,419,335
							Ave.	
Total	64,256	5,940,143	933,378	6,108,378	3,333,569	16,379,724	69%	\$14,438,549
% Catch by Species								
	.4%	36%	7%	37%	20%			
Difference							Increase	
	-102,537	+1,301,410	+227,449	+1,700,572	+568,924	+3,695,818	7%	\$4,024,473
% Change								
	Decrease 61%	Increase 28%	Increase 32%	Increase 39%	Increase 21%	Increase 29%		

TABLE 11

SOUTHERN DISTRICT

<u>Year</u>	<u>Kings</u>	<u>Reds</u>	<u>Cohos</u>	<u>Pinks</u>	<u>Chums</u>	<u>Total</u>	<u>% of Inlet Catch</u>	<u>Amt. Paid Fishermen</u>
1954	1,532	22,913	12,235	180,977	150,769	368,426	7%	\$ 157,324
1955	562	30,848	3,230	565,216	24,398	624,254	22%	239,995
1956	310	33,054	4,693	150,486	53,515	242,058	6%	137,662
1957	286	19,431	1,507	130,511	57,403	209,138	9%	111,046
1958	119	17,731	1,713	209,798	24,096	253,457	6%	134,793
1959	74	10,026	709	50,076	15,278	76,163	6%	42,784
Total	2,883	134,003	24,087	1,287,064	325,459	1,773,496	Ave. 9%	\$ 823,604
% Catch by Species	.01%	8%	1%	73%	18%			
1960	12	12,292	1,237	250,818	4,100	268,459	7%	139,464
1961	39	10,180	1,161	191,911	2,924	206,215	10%	108,069
1962	58	16,569	2,095	564,050	9,089	591,861	8%	297,298
1963	88	13,142	4,020	99,829	7,695	124,774	6%	72,320
1964	84	17,283	8,905	266,489	11,529	304,290	4%	134,919
1965	6	11,600	1,715	79,327	703	93,351	5%	46,997
Total	287	81,066	19,133	1,452,424	36,040	1,588,950	Ave. 7%	\$ 799,067
% Catch by Species	.02%	5%	1%	91%	2%			
Difference	-2,596	-52,937	-4,954	+165,360	-289,419	-184,546	Decrease 2%	\$ 24,537
% Change	Decrease 90%	Decrease 40%	Decrease 21%	Increase 13%	Decrease 89%	Decrease 10%		

TABLE 12

KAMISHAK BAY DISTRICT

<u>Year</u>	<u>Kings</u>	<u>Reds</u>	<u>Cohos</u>	<u>Pinks</u>	<u>Chums</u>	<u>Total</u>	<u>% of Inlet Catch</u>	<u>Amt. Paid Fishermen</u>
1954	NO FISHERY							
1955		2	8	5,121	278	5,409	.18%	\$ 1,810
1956		67	701	193	14,936	15,898	.36%	8,341
1957		4,335	29	5,905	10,856	21,220	.90%	14,363
1958	NO FISHERY							
1959		1,549	43	5,325	25,759	32,676	2%	17,221
Total		5,953	781	16,544	51,829	75,203	Ave. .6%	\$ 41,735
% Catch by Species		8%	1%	22%	69%			
1960	11	768	28	11,563	44,328	56,698	1%	\$ 33,228
1961		1	14	6,019	12,465	18,499	.9%	10,323
1962		20	11	219	6,058	6,308	.08%	3,778
1963	1	4	97	82,314	13,892	96,308	5%	44,661
1964	5	1,979	115	20,719	42,280	65,098	.9%	35,668
1965		800	400			1,200	.06%	1,576
Total	17	3,572	665	120,834	119,023	244,111	Ave. 1%	\$ 129,234
% Catch by Species		1.5%	.2%	49%	49%			
Differ- ence	17	- 2,381	- 116	+ 104,290	+ 67,194	+ 168,908	.4%	\$ 87,499
% Change		Decrease 40%	Decrease 15%	Increase 630%	Increase 130%	Increase 224%		

TABLE 13

OUTER DISTRICT

<u>Year</u>	<u>Kings</u>	<u>Reds</u>	<u>Cohos</u>	<u>Pinks</u>	<u>Chums</u>	<u>Total</u>	<u>% of Inlet Catch</u>	<u>Amt. Paid Fishermen</u>
1954	13	4,927	369	82,205	112,877	200,291	4%	\$ 75,924
1955	7	701	277	557,997	40,887	599,869	20%	201,647
1956	23	2,889	190	42,368	19,248	64,718	2%	30,764
1957	13	2,982	110	149,197	138,171	290,473	12%	133,114
1958	1	1,719	83	739,768	100,386	841,957	21%	390,602
1959	3	10,365	109	68,875	65,675	145,027	11%	75,022
Total	60	23,583	1,138	1,640,410	477,244	2,142,435	Ave. 11%	\$ 907,073
% Catch by Species		1%	.05%	77%	22%			
1960	4	1,336	533	328,501	67,187	397,561	10%	\$ 197,197
1961	2	12,595	444	105,447	40,204	158,692	8%	92,399
1962	2	8,697	1,893	1,684,023	126,750	1,821,365	24%	882,228
1963	6	1,974	369	21,462	116,923	140,734	7%	82,897
1964	2	1,370	431	767,396	269,512	1,038,711	15%	432,750
1965				30,000	34,100	64,100	3%	31,642
Total	16	25,972	3,670	2,936,829	654,676	3,621,163	Ave. 11%	\$1,719,113
% Catch by Species		.7%		81%	18%			
Differ- ench		+2,389	+ 2,532	+1,296,419	+ 177,432	+1,478,728	None	\$ 812,040
% Change		Increase 10%	Increase 222%	Increase 79%	Increase 37%	Increase 69%		

TABLE 14

EASTERN DISTRICT

<u>Year</u>	<u>Kings</u>	<u>Reds</u>	<u>Cohos</u>	<u>Pinks</u>	<u>Chums</u>	<u>Total</u>	<u>% of Inlet Catch</u>	<u>Amt. Paid Fishermen</u>
1954		11,786	2,556	7,562	1,945	23,849	.4%	\$ 19,392
1955	4	5,049	6,160	55,994	3,147	70,354	2.4%	31,608
1956	1	296	3,761	14,873	519	19,450	.45%	10,375
1957	120	169	119		20	428	.01%	965
1958				200		200	.05%	90
1959	58	5,477	8,954	125	14,612	29,226	2%	24,267
Total	186	22,777	21,550	78,754	20,243	143,507	Ave. .9%	\$ 86,697
% Catch by Species	1%	16%	15%	55%	14%			
1960		105	853	8,720	467	10,145	.2%	\$ 5,383
1961				NO FISHERY				
1962			3,728	49	10	3,787	.04%	3,757
1963	1	1	2,250	11		2,263	.01%	2,261
1964		22	22	813	12	869	.01%	346
1965				NO FISHERY				
Total	1	128	6,853	9,593	489	17,064	Ave. .3%	\$ 11,747
%Catch by Species		.7%	40%	56%	3%			
Differ- ence	-185	-22,649	-14,697	-69,161	-19,754	-126,443	.6%	\$ 74,950
% Change	Decrease 100%	Decrease 99%	Decrease 68%	Decrease 88%	Decrease 98%	Decrease 88%		

THE FUTURE

Little basic salmon research has been done in Cook Inlet. A research program, financed largely with federal aid funds has been approved. The goal is, "To provide the basic biological data on the Cook Inlet sockeye salmon stocks, including optimum escapement levels and prediction of the runs in order to provide proper management of the resource."

Research will be continued on a sonar fish counting device so that numbers of salmon escaping into spawning areas can be determined. Work on this equipment started in Cook Inlet in 1961, and by the summer of 1965 an advanced experimental model was in use in Cook Inlet. When fully developed, the sonar salmon counter will be useful throughout Alaska.

Also under the new federal aid program, a comprehensive sampling plan will be developed to provide annual records of characteristics of salmon caught in various gill net fishing areas of the Inlet. Spawning ground sampling for the same characteristics will be conducted at selected points in each of the three major spawning systems, with the hope that it will be possible to determine which stocks of fish various segments of the fishery are harvesting, so that the fishery can be managed to allow maximum harvest and optimum escapement to individual drainages.

Estimates will be made of outmigrations of smolts as they leave fresh water for the sea. These data should provide a basis for evaluation of escapement levels, and eventually they may provide a basis for forecasting the size of returning runs of salmon.

Forecasts of strength of returning pink salmon runs is the eventual goal of another federal-aid research project, commenced in Cook Inlet in 1962 with state funds, and now continuing in expanded form with federal assistance. The work started in lower Cook Inlet will be expanded, as funds permit, to the upper Inlet.

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